
BIOMONITORING IN RI

Volume 2, Issue 1

Winter 2003

A quarterly newsletter published by the Rhode Island Department of Health (HEALTH) to provide information on trends and issues regarding environmental chemicals and biomonitoring activities in Rhode Island.

HEALTH Develops Biomonitoring Study Plan: Fetal Exposure to Chemicals

By Mike DiMatteo and Dhitinut Ratnapradipa

The Biomonitoring Assessment Team (BAT) at HEALTH has developed a study plan for its biomonitoring program. The study will measure levels of mercury, cotinine (a chemical marker of tobacco smoke), and possibly other heavy metals in cord blood. The study will help assess the level of exposure to these chemicals of at-term newborns. Justification for focusing on this group is that it represents the human population most at risk of injury from these chemicals. The study will also serve as a prototype for the collection of cord blood specimens for biomonitoring purposes and will enhance the State's analytical capabilities for processing these specimens.

continued on page 2, column 1

CONTACT INFORMATION

Mike DiMatteo- Laboratory Coordinator, Biomonitoring Project. (401) 222-1969

michael_dimatteo@doh.state.ri.us

Dhitinut Ratnapradipa- Risk Coordinator, Biomonitoring Project (401) 222-7764, dhitinutR@doh.state.ri.us

Gregory Hayes, Dr. P.H.- Associate Director, Laboratories (401) 222-5554, gregH@doh.state.ri.us

Walter S. Combs, Jr., PhD -Executive Director, Environmental Health, (401) 222-3118

waltc@doh.state.ri.us

HEALTH Raises Awareness & Collaborates with Medical Community

By Dhitinut Ratnapradipa

Biomonitoring can be very useful for assessing exposure to environmental chemicals. HEALTH plans to assess the exposure of developing fetuses to mercury, cotinine and other chemicals by measuring the levels of these substances in cord blood specimens (see other article for further details). The project will be used to develop new, and support existing, intervention programs to reduce or eliminate such exposures.

Collaboration and involvement of the medical community is essential for the success of the project. The Biomonitoring Assessment Team at HEALTH developed several effective methods to achieve these objectives. One method is to hold a series of grand rounds at local hospitals. These grand rounds are educational programs established at many area hospitals to provide continuing education to physicians. Given the enhanced susceptibility of children and pregnant women to environmental chemicals, pediatricians and obstetricians will be the primary audience. The office of Risk Assessment, within the Environmental Health Division at HEALTH has held one such grand round at WIH on March 7, 2003. The speaker was Margaret Kane of the American Lung Association and focused primarily on the exposure of people to environmental tobacco smoke and the efforts to measure this exposure through biomonitoring. The grand round session was successful in increasing the awareness of physicians. A second grand rounds session is being planned for

continued on page 2, column 2

Specimen Collection/Specimen Type

Umbilical cord blood will be used to measure the levels of the chemicals. Cord blood was selected for the following reasons: 1) the study's focus on late term fetal exposure, 2) the non-invasiveness and ease of collection and 3) the availability of a benchmark dose (BMD) for mercury in cord blood developed by the National Research Council.

Specimen Number

The study will last at least one year to capture potential seasonal variability in exposures. It is estimated that over a year's time as many as 10,000 potential cord blood specimens will be analyzed.

Specimen Collection Methodology

Birthing hospitals routinely collect cord blood specimens. These specimens are suitable for mercury and other chemical analysis. Once the specimens are collected, HEALTH will arrange for delivery of the specimens to its Chapin Building Laboratory located in Providence, RI.

Specimen Analysis

HEALTH Laboratories will measure the levels of mercury and other metals using inductively coupled plasma mass spectroscopy (ICP-MS) with high performance liquid chromatography (HPLC) technology. Another technology that may be used is cold vapor atomic absorption (CVAA) spectrometry. Exposure to the organic form of mercury is the primary concern of health professionals since it is considered to be most harmful to humans. A primary source of organic mercury is through the consumption of certain foods, primarily mercury contaminated seafood.

As part of a regional biomonitoring effort (see sidebar article), HEALTH is making plans to deliver specimens to the Connecticut State Laboratory for cotinine analysis. Once there, the specimens will be analyzed using liquid chromatography, tandem mass spectrometry (LC/MS/MS) technology. By measuring the levels of cotinine in cord blood, investigators hope to gain a better understanding of the exposure of developing fetuses to environmental tobacco smoke. This may in turn assist in efforts to reduce exposure to this vulnerable population. ♣

April or May 2003 to present the issues surrounding mercury exposure and its assessment using biomonitoring techniques. More details about this upcoming presentation will be announced shortly.

HEALTH is also seeking study collaborations with several area hospitals. Dr. Halit Pinar, Director of Perinatal and Developmental Pathology at Women & Infants Hospital (WIH) and Dr. Thomas Raskauskas, Chief of the Ob/Gyn Department from the Memorial Hospital of Rhode Island (MHRI) have expressed interest in participating and partnering in several Biomonitoring studies. ♣

HEALTH Participates in New England Biomonitoring Consortium

By Mike DiMatteo and Dhitinut Ratnapradipa

Rhode Island has joined forces with Connecticut, Maine and Vermont to develop a regional biomonitoring effort. This consortium of states, called the New England Four (NE4) Biomonitoring Consortium, is in the process of developing a plan that will allow states to take advantage of expertise available at each health laboratory. The plan will involve 4 biomonitoring projects phased in over a 5-year period. Studies will be conducted on mercury and other heavy metals, cotinine, radionuclides, and select pesticides. The goal of the consortium would be to have analytical information for populations in each New England State that could then be compared and used to assess the degree of exposure.

If the consortium is awarded funding from a Centers for Disease Control grant announcement, funding to complete the project will be distributed among the States. HEALTH representatives, including Greg Hayes, Michael DiMatteo, and Dhitinut Ratnapradipa participated in a two day meeting on March 26th and 27th in Manchester, New Hampshire. The consortium agreed to use the RI Study Plan for mercury as a basis for developing the 3 other projects (listed above). The consortium will develop and submit a single grant application in June 2003. If approved for funding, the consortium will proceed with activities beginning October 2003.